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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/472,263	12/27/1999	PAUL H. STALLINGS	31408-10229	8507

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EXAMINER
DAY, HERNG DER

ART UNIT	PAPER NUMBER
2123	11

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PPG

Office Action Summary	Application No.	Applicant(s)	
	09/472,263	STALLINGS ET AL.	
	Examiner	Art Unit	
	Herng-der Day	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This communication is in response to Applicants' Amendment (paper # 8) to Office Action dated November 20, 2002 (paper # 5), mailed April 9, 2003.

1-1. Claim 1 has been amended; claims 2-25 have been added; claims 1-25 are pending.

1-2. Claims 1-25 have been examined and claims 1-25 have been rejected.

Drawings

2. The Draftsperson has objected to the drawings; see the copy of Form PTO 948 for an explanation.

Information Disclosure Statement

3. As described in page 5 of the substitute specification (paper # 9), "Specific embodiments of the invention will be discussed as using ACIS". The Examiner requests detailed information about the ACIS Geometric Modeler referred to in the specification because it appears to be reasonably necessary to the examination of this application and cannot be found.

Abstract

4. The abstract of the disclosure is objected to because it exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

Specification

5. Applicants submitted a substitute specification and amended the specification. The objection to the specification in paper # 5 has been withdrawn.

6. The amendment filed April 9, 2003, is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The amended material, which is not supported by the original disclosure, is as follows:

(1) added new claim 9, as described in page 7 of paper # 8.

(2) added new claim 10, as described in page 7 of paper # 8.

(3) added new claim 20, as described in page 9 of paper # 8.

(4) added new claim 21, as described in page 9 of paper # 8.

Claims 9-10 and 20-21 introducing the new matter are also rejected under 35 U.S.C. 112, first paragraph, as detailed in sections **10-1** and **10-2** below.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

7. Applicants submitted a substitute specification and amended as well as added claims. The objection to the claim has been withdrawn.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

For example, at page 9 of the substitute specification, as described in line 21, variables x, y, and z are defined in the domain of function f•s1(x,y,z). It is contradictory to the definition of function s1(u,v) as described in line 16. Also note, another contradictory definition exists between function f•c1(x,y,z) and function c1(t) at page 10. Accordingly, without undue experiment, it is unclear how one skilled in the art may use those defined functions, i.e., f•s1(x,y,z) and f•c1(x,y,z), to perform the function composition.

Also note, the transformation function f as defined in page 9 of substitute specification is a 1 x 3 vector. Without undue experiment, it is unclear how one skilled in the art may obtain the composed functions sf1 and cf1, as shown in line 21 of page 9 and line 7 of page 10, which are 3 x 1 vectors.

10. Claims 9-10 and 20-21 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

10-1. The added new claims 9 and 20 recite the limitation "the geometry of the solid model has a domain space having three dimensions" in the claim. The added limitation does not appear to be supported by the original disclosure because only 2-dimensional domain space and 1-

dimensional domain space has been disclosed, for example, in pages 6 and 7 of the substitute specification. Therefore, claims 9 and 20 eventually contain subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

10-2. The added new claims 10 and 21 recite the limitation "the geometry of the solid model has a domain space having greater than three dimensions" in the claim. The added limitation does not appear to be supported by the original disclosure because only 2-dimensional domain space and 1-dimensional domain space has been disclosed, for example, in pages 6 and 7 of the substitute specification. Therefore, claims 10 and 21 eventually contain subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined

was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

12. Claims 1-2, 7-15, and 20-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Silva et al., U.S. Patent 6,184,901 issued February 6, 2001 and filed December 31, 1997.

12-1. Regarding claim 1, Silva et al. disclose a method for using surface and curve functions and positions in a CAD model to define the geometry of a shape to allow the transformation of the shape with a function, said method comprising the steps of:

Obtaining a solid model containing one or more faces, edges and/or vertices, where the underlying geometry of each face, edge or vertex may be represented, respectively by a surface, curve, or position, and each surface or curve may be represented by a function mapping from a domain space into 3-dimensional space (master object 210, column 11, lines 16-19);

Defining a transformation function mapping from 3-dimensional space to 3-dimensional space (object space modifier 220, column 11, lines 22-23);

Creating new surface and curve functions by performing function composition with each of the existing surface and curve functions with the transformation function (transform 230, column 11, lines 23-33);

Creating new surfaces and curves by taking each point in the domain of each of the original surface and curve functions and passing the point through the corresponding new function, and creating new positions by passing each original position through the transformation function (derived object representation 246, column 11, lines 47-49); and

Resetting the geometry of the CAD model (rendering, column 11, lines 49-59).

12-2. Regarding claim 2, Silva et al. disclose a method for transforming the geometry of a solid model with a transformation function, comprising the steps of:

providing a solid modeler (3D Studio Max™, column 4, lines 19-20);

obtaining a solid model having a topology and a geometry corresponding to said topology (three dimensional (3D) object, column 1, lines 37-39);

defining a transformation function (transformations, column 1, lines 37-39); and

transforming the geometry of the solid model by said transformation function (applies, column 1, lines 37-39).

12-3. Regarding claim 7, Silva et al. further disclose comprising the step of displaying the solid model after the step of transforming the geometry (on display device 130, column 11, lines 56-59).

12-4. Regarding claim 8, Silva et al. further disclose comprising the step of storing said solid model after the step of transforming the geometry (display buffer 260, column 11, lines 56-59).

12-5. Regarding claim 9, Silva et al. further disclose the geometry of the solid model has a domain space having three dimensions (parametric definition, column 11, lines 16-19).

12-6. Regarding claim 10, Silva et al. further disclose the geometry of the solid model has a domain space having greater than three dimensions (parametric definition, column 11, lines 16-19).

12-7. Regarding claim 11, Silva et al. further disclose the transformation function defines a non-linear transformation (Twist, column 8, lines 1-6).

12-8. Regarding claim 12, Silva et al. further disclose the transformation function defines a bend transformation (Bend, column 7, lines 47-50).

12-9. Regarding claim 13, Silva et al. further disclose the transformation function defines a stretch transformation (EditSpline, column 8, lines 23-25).

12-10. Regarding claim 14, Silva et al. further disclose the transformation function defines a twist transformation (Twist, column 8, lines 1-6).

12-11. Regarding claim 15, Silva et al. further disclose a method for transforming a solid model using a generalized transformation function mechanism, comprising the steps of:

providing a computer aided design system adapted to display a solid model (Display Device 130, Figure 1) and having a transformation component adapted to transform said solid model using a transformation function (Tube Modifier Stack 199, Figure 1);

obtaining said solid model, wherein said solid model has a geometry and a topology (master object 210, column 11, lines 16-19);

displaying said solid model (tube 300, column 12, lines 32-39);

obtaining a transformation function (object space modifier 220, column 11, lines 22-23);

operating said transformation component to transform the geometry of said solid model with said transformation function (derived object representation 246, column 11, lines 47-49);

displaying the solid model after the geometry has been transformed with said transformation function (on display device 130, column 11, lines 56-59); and

storing said solid model after the geometry has been transformed with said transformation function (display buffer 260, column 11, lines 56-59).

12-12. Regarding claim 20, Silva et al. further disclose the geometry of the solid model has a domain space having three dimensions (parametric definition, column 11, lines 16-19).

12-13. Regarding claim 21, Silva et al. further disclose the geometry of the solid model has a domain space having greater than three dimensions (parametric definition, column 11, lines 16-19).

12-14. Regarding claim 22, Silva et al. further disclose the transformation function defines a non-linear transformation (Twist, column 8, lines 1-6).

12-15. Regarding claim 23, Silva et al. further disclose the transformation function defines a bend transformation (Bend, column 7, lines 47-50).

12-16. Regarding claim 24, Silva et al. further disclose the transformation function defines a stretch transformation (EditSpline, column 8, lines 23-25).

12-17. Regarding claim 25, Silva et al. further disclose the transformation function defines a twist transformation (Twist, column 8, lines 1-6).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 3-6 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silva et al., U.S. Patent 6,184,901 issued February 6, 2001 and filed December 31, 1997, in view of Kalay, "Modeling Polyhedral Solids Bounded by Multi-Curved Parametric Surfaces", Proceedings of the Nineteenth Design Automation Conference, 1982, pages 501-507.

14-1. Regarding claims 3-6, Silva et al. disclose the master object 210 includes a parametric definition of an instance of a subclass of Object (e.g. the topology and geometry) in column 11, lines 16-19. Although Silva et al. suggest, for example, the topology may comprise mesh and direction of faces and the geometry may comprise vertices and edges, Silva et al. fail to expressly disclose: (1) the topology comprises one or more faces, edges and vertices; and (2) the correspondence between the geometry and the topology.

Kalay proposes a hierarchical representation of shape data fir modeling solids bounded by curved surfaces in Figure 4-1. Specifically, Kalay discloses:

(Claim 3) topology comprises one or more faces, edges and vertices (Kalay, FACES, EDGES, VERTICES, Figure 4-1);

(Claim 4) the geometry is comprised of a set of one or more functions, where each function defines a surface, curve or position of said geometry (Kalay, PATCH, CURVE, POINT, Figure 4-1);

(Claim 5) each surface in the geometry corresponds to a face in the topology, each curve in the geometry corresponds to an edge in the topology and each position in the geometry corresponds to a vertex in the topology (Figure 4-1).

Silva et al. further disclose the step of transforming the geometry of the solid model comprises the steps of:

(Claim 6) composing each function in the set of functions of the geometry with the transformation function to create a set of one or more transformed functions (transform 230, column 11, lines 23-33); and

resetting the geometry of the solid model to the set of transformed functions (rendering, column 11, lines 49-59).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Silva et al. to incorporate the teachings of Kalay to obtain the invention as specified in claims 3-6 because Kalay discloses in detail the topology, the geometry, and their relationship as suggested by Silva et al. (Silva, column 11, lines 16-19).

14-2. Regarding claims 16-19, Silva et al. disclose the master object 210 includes a parametric definition of an instance of a subclass of Object (e.g. the topology and geometry) in column 11, lines 16-19. Although Silva et al. suggest, for example, the topology may comprise mesh and direction of faces and the geometry may comprise vertices and edges, Silva et al. fail to expressly disclose: (1) the topology comprises one or more faces, edges and vertices; and (2) the correspondence between the geometry and the topology.

Kalay proposes a hierarchical representation of shape data fir modeling solids bounded by curved surfaces in Figure 4-1. Specifically, Kalay discloses:

(Claim 16) topology comprises one or more faces, edges and vertices (Kalay, FACES, EDGES, VERTICES, Figure 4-1);

(Claim 17) the geometry is comprised of a set of one or more functions, where each function defines a surface, curve or position of said geometry (Kalay, PATCH, CURVE, POINT, Figure 4-1);

(Claim 18) each surface in the geometry corresponds to a face in the topology, each curve in the geometry corresponds to an edge in the topology and each position in the geometry corresponds to a vertex in the topology (Figure 4-1).

Silva et al. further disclose the step of transforming the geometry of the solid model comprises the steps of:

(Claim 19) composing each function in the set of functions of the geometry with the transformation function to create a set of one or more transformed functions (transform 230, column 11, lines 23-33); and

resetting the geometry of the solid model to the set of transformed functions (rendering, column 11, lines 49-59).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Silva et al. to incorporate the teachings of Kalay to obtain the invention as specified in claims 16-19 because Kalay discloses in detail the topology, the geometry, and their relationship as suggested by Silva et al. (Silva, column 11, lines 16-19).

Applicant's Arguments

15. Applicants argue the following:

(1) "The specification has been amended to overcome the Examiner's objection" (page 10, paper # 8).

(2) "The function definitions are not contradictory" (page 11, paragraph 2, paper # 8).

(3) "Applicant has amended claim 1 to delete the word "arbitrary"" (page 11, paragraph 3, paper # 8).

(4) "Chen merely illustrates the prior art of known linear transformations" (page 12, paragraph 2, paper # 8).

Response to Arguments

16. Applicants' arguments have been fully considered.

16-1. Response to Applicants' argument (1). The objection to the specification in paper # 5 has been withdrawn. However, Claims 9-10 and 20-21 are objected to as introducing new matter, as detailed in section **6** above.

16-2. Response to Applicants' argument (2). Applicants' arguments are not persuasive. Claims 1-25 are rejected under 35 U.S.C. 112, first paragraph, as detailed in section **9** above.

16-3. Response to Applicants' argument (3). The original claim rejections under 35 U.S.C. 112, second paragraph, for indefiniteness have been withdrawn.

16-4. Response to Applicants' argument (4). Applicants' assertions are moot because new prior art have been used. Claims 1-2, 7-15, and 20-25 are rejected under 35 U.S.C. 102(e), as detailed in sections **12-1** to **12-17** above. Claims 3-6 and 16-19 are now rejected under 35 U.S.C. 103(a), as detailed in sections **14-1** and **14-2** above.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Herng-der Day whose telephone number is (703) 305-5269. The examiner can normally be reached on 9:00 - 17:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin J Teska can be reached on (703) 305-9704. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Herng-der Day
August 10, 2003

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER